looking ahead

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In This Issue –

Technical Cooperation—

Sowing the Seeds of Progress

Partial text of a Statement released in June by the NPA Special Policy Committee on Technical Cooperation.

TECHNICAL COOPERATION is the sharing of scientific and technical knowledge and skills among peoples--helping each other adapt and use such knowledge and skills to achieve greater productivity and better utilization of resources, increase incomes, and raise levels of living. It spurs the accumulation of new knowledge and the invention of new techniques for translating knowledge into action. Fields for cooperation include health, education, government organization and administration, as well as such directly productive fields as agriculture, manufacturing, mining, and transportation. Technical assistance flows through both public and private channels—the latter being the older, with larger volume.

Technical cooperation does not include economic aid or developmental assistance in the form of private investment or public loans or grants, nor grants of armament material and other forms of military assistance. However, technical cooperation usually increases the effectiveness of economic aid, and frequently accompanies it. Military assistance is an important phase of the cold war, but it seldom has a direct relationship to technical cooperation programs....

We believe there are few doubts in the minds of most people in the United States as to the desirability of private programs of technical cooperation. Such doubts as there are relate primarily to public programs, bilateral and multilateral. We believe that these doubts will tend to disappear with the fuller appreciation of the fact that the public programs are increasingly limited to activities which private agencies are not likely to undertake, but which are needed in the cooperating countries and which serve to make private programs more fully effective. Without concurrent public programs in these fields, rapid industrial development may cause economic imbalance and social unrest. Similarly, doubts of those

(continued on page 2)

Identical Goals

Society expects more and more of the individual, as he benefits from the fruits of our dynamic economy and the group living made possible by the combined social units of many families. In a similar manner, society expects more and more of business, almost in direct ratio to the economic climate made possible by the specialized and mass markets of the nation.

While business is now doing a good job of "selling" itself and our industrial system to the public, we all know that the task has just started. The goal toward which each man and woman is working is a simple one--a better standard of living. The goal of business is identical with that of the average man--a better standard of living--not just for a chosen few, but for everybody. The job is to convince the public that this simple statement is the truth.

From a speech by Harry A. Bullis, chairman of the board of General Mills, Inc. and treasurer of NPA, made at the 43rd annual meeting of the Chamber of Commerce of the United States.

in host countries will tend to disappear as they learn that the public, as well as the private, programs are designed to help them help themselves to achieve a better life; that the programs are not a disguised effort to impose upon them strange institutions and a foreign way of life, and to reap for a foreign country all of the benefits achieved...

The NPA Policy Committee believes that public and private technical cooperation programs should be continued for many important reasons.

- In most less developed countries there is a much stronger determination than ever before to achieve, by one route or another, economic development and better standards of living. Technical cooperation--public and private--is democracy's route for expediting in these countries economic growth accompanied by social improvement and political independence--the exact opposite of the economic dictation, social repression, and political slavery of the police state. As a cooperative effort among the governments and peoples of independent countries, the technical cooperation programs stand in sharp contrast to the ideological and military aggression of international communism. In various ways, technical cooperation in the less developed countries strengthens resistance to communist infiltration and helps build in them the will and power to be free and independent.
- Technical cooperation is a spur to international trade. By accelerating industrial development, increasing the production of food and raw materials, improving productivity, and enhancing purchasing power, it helps cooperating countries to make larger amounts of goods and services available for export, and to increase their ability to purchase imports. This benefits all the cooperating countries.
- Technical cooperation contributes to international understanding. The people and governments of the cooperating countries learn more about each other's motivations and the underlying reasons for different approaches to common problems. "Iron curtains" cannot tolerate the penetration of two-way technical cooperation.
- Technical cooperation directly benefits the United States as well as other countries. These benefits are especially welcome to the United States in this period when it is considered to be the international leader of the free world. Technical cooperation gives U. S. nationals a better understanding of the political, economic, and social conditions and problems in the cooperating countries; leads them to reappraise and improve their attitudes toward, and ways of working with, other peoples; and helps to set a higher standard of international behavior.
- Technical cooperation increases the rate of growth of knowledge and its utilization in all cooperating countries. It brings the benefits of cross-fertilization to basic technological concepts and to methods for their application. This process enriches and enlarges the reservoir of know-how available to the democratic nations.
- Technical cooperation provides an unusually large return for a relatively small monetary investment. It is essentially a "seeding" operation. The seeds are not basically capital or material, but are new ways of doing things, new methods and programs. Usually these are on a demonstration basis. They spread--at decreasing cost--because they are improvements, and they become embedded in the culture and economy of the host country. Results in terms of increased goods, services, and satisfactions are great in comparison to the cost of the initial programs, public or private.

The NPA Policy Committee believes that acceptance of the following recommendations will increase the yield from technical cooperation.

- For the foreseeable future, the public programs of technical cooperation should be accepted as an important long-term activity of the U. S. government, the United Nations and its specialized agencies, and the Organization of American States.
- These agencies should be enabled to expand their cooperation with any country where the programs are needed, if that country demonstrates initiative in planning and launching the programs and stands ready to help support them wholeheartedly from its own resources. Especially needed in many countries are programs that will stimulate initiative and enterprise in the wider application of improved technologies and skills.
- Legislative, administrative, and financial continuity should be established for the public programs without further delay. (Specific recommendations concerning administrative continuity for the U. S. bilateral programs were made in our statement, Organization of the United States Government for Technical Cooperation.)
- Foundations and other philanthropic organizations, religious groups, and business firms

operating abroad should plan their technical cooperation activities on a long-term basis, and expand them where they can make an important contribution to economic and social development.

The private and public agencies and groups engaged in technical cooperation should work more closely with each other in determining the respective roles which each can perform most effectively; continuously exchange information; and cooperate in planning and launching their respective programs, and in appraising their effectiveness.

(Full text of the Committee Statement available from: NPA. 1955. 15¢)

Automation Information

FOUR BIBLIOGRAPHIES on automation and related subjects have been prepared by Ted F. Silvey, member of the NPA Labor Committee, whose article "Automation—New Impact and Challenge" appeared in the October 1954 issue of "Looking Ahead."

Material available in limited quantities from Mr. Silvey includes: a catalog of automation items, containing a list of speeches, reports, and pamphlets, revised August 30, 1955; a list of books and technical magazines about automation; automation listings in the New York Times Index, revised through August 30, 1955; and a bibliography of articles about automation and related subjects in general magazines. For the last item mentioned, Mr. Silvey's source was the "Reader's Guide to Periodical Literature" which was checked for about 20 subject entries ranging from automatic controls to servo-mechanisms and steering gear.

Of similar interest is a short dictionary of automation terms compiled by Clarence L. Peterson, vice-president of the Brown Instruments Division of Minneapolis-Honeywell Regulator Company. The dictionary appears in the July issue of "Advanced Management." Mr. Peterson calls his definitions purposely simplified "for those whose knowledge of automatic control is largely limited to the setting of the thermostat on the living room wall." It will be of assistance to the non-engineer confronted by this specialized vocabulary in reading and business.

(A limited number of automation bibliographies available free from: Ted F. Silvey, National CIO Headquarters, 718 Jackson Place, N.W., Wash. 6.)

—the people of NPA—

Charles J. Symington

Charles J. Symington, board chairman of Symington-Gould, and a member of NPA's board of trustees, has devoted a large part of his extraordinary energy in recent years to the NPA. He has been an active participant on the Business Committee of which he is also a member. As one of the originators of the NPA series of case studies of U. S. Business Performance Abroad, and chairman of the policy committee supervising that activity, he has assumed leadership in developing this significant series of case studies of overseas operations of many large American companies. In this capacity, he has interested some of America's most important corporations in letting their overseas activities be studied by objective economists and sociologists. Mr. Symington was born in Baltimore, Maryland, attended schools in Richmond and Belleview, Virginia and studied at Amherst College. He is now board chairman of The Symington-Gould Corporation, railway equipment manufacturers, with headquarters in New York City. Mr. Symington embarked on his career in 1903 as a day laborer in West Virginia. He joined T. H. Symington & Company (predecessor of Symington-Gould) as a salesman in 1907, subsequently succeeding to the positions of manager of Eastern sales, sales vice president, president and chairman of the board. Mr. Symington is board chairman and a director of The Wayne Pump Company, Salisbury, Maryland, and Fort Wayne, Indiana. He also is a member of the Advisory Council of The Hospital for Special Surgery and a member of the board of trustees of the General Theological Seminary, both in New York City.

Farming without Farmland by Soilless Cultivation

VEGETABLES CAN BE made to thrive in a plot of gravel or flourish without soil on a city roof top. The explanation of what to a "dirt farmer" must seem a preposterous idea is found in the science of hydroponics--water culture or soilless cultivation. Some persons believe intensive cultivation of plants in water may be the answer to widespread hunger in heavily populated areas of the world; others call hydroponics a useful laboratory technique but of only very limited value in commercial food production.

Hydroponics frees plant culture from dependence on fertile soil and permits growth of crops in a controlled nutrient solution, requiring only that the plant roots be supported in some way, and that the appropriate conditions of light and weather be present. Hence, deserts, rocky hillsides, factory roofs, window boxes in crowded metropolitan areas can be made to produce food if water, chemical plant food, and an adequate container are available.

J.W.E.H. Sholto Douglas says in a recent issue of "Impact of Science on Society," the UNESCO quarterly journal, "It is no exaggeration to say that hydroponics may mean as much to the landless worker as the abolition of slavery." In countries like India, where he has been responsible for hydroponic experiments at the West Bengal Agricultural Institute, he feels that the large scale introduction of family size hydroponic gardens can overcome the terrible presence of local hunger. "In fact," Sholto Douglas continues, "soilless cultivation, conducted according to the new simplified methods, can make all the large cities of the globe, such as New York, London, Paris, Calcutta, Buenos Aires, Rome, and Tokyo, self-supporting in all vegetables, thus leaving the available fertile country farmlands free to concentrate on cereal production."

Various hydroponic methods of growing crops have been tried. One simple adaptation is plant culture in a tank of water, however, this presents difficulties for supporting plant roots and the proper control of light, oxygen, and solution. The best method to date, according to one expert, is a variation of sub-irrigation or gravel culture in which plants are supported in shallow tanks by a coarse aggregate such as chipped rocks and sand, and the nutrient solution is conveyed to the plant beds through pipes or flumes. A gravity feed system may be employed which permits the solution to pass down to successively less elevated beds, emptying finally into a sump tank.

WHETHER soilless cultivation is a profitable enterprise must, of course, depend on competitive local conditions. If agriculture is difficult or impossible, or costs for soil-produced crops are higher than for hydroponic products in a given area, the hydroponic undertaking will prove worthwhile.

Comparing the opinions of certain American experts with Sholto Douglas' report, one is struck by notable differences in emphasis. Stressing simplicity and economy of hydroponics as compared with soil cultivation in India, Sholto Douglas cites as advantages, much higher crop yields, quicker growth, consistent crops of high quality, reduction in growing area made possible by closer planting, less labor, and no hard manual work. Excluding time required for harvesting, Sholto Douglas says 40 hours a month are sufficient for cultivation of one acre planted in hydroponic gardens, and that the cost of nutrients would fall somewhere between $4.20 and $8.40 a month for the area.

Americans stress the large amount of technical knowledge required to ensure commercial success with hydroponics and consider reports of its usefulness to be overly optimistic. Dr. Tom Eastwood in an article "Hydroponics and Food Production," for the U.S. Department of Agriculture's publication, "Foreign Agriculture," recognizes that hydroponic costs will be competitive in barren oceanic islands, arid mainland areas where agricultural soils are limited, and densely populated areas "whose hinterland cannot supply sufficient food," but he warns, "plants do not change growth habits because they have their mineral requirements spoon-fed to them." Therefore, plants grown in water, he says, like soil crops, must be protected from disease, insects, and rodents, and standard horticultural practices must be applied.

Eastwood puts the cost of constructing hydroponic units at about $25,000 to $100,000 an acre for commercial installations and calls labor and supervisory personnel costs high be-

cause "...hydroponics is a relatively precise means of crop culture and requires a knowledge of the peculiarities of the method and an elementary knowledge of chemistry."

In this country, says Neil W. Stuart, physiologist with the Agricultural Research Service of the U.S. Department of Agriculture, the future development of hydroponics "will probably be confined to the production of crops having a relatively high unit value—ornamentals, out-of-season vegetables, or seedlings for transplanting."

The U. S. Army and the Air Force have used hydroponic gardens in the Pacific, and originally, according to a U. S. Army Fact Sheet, deciding that Japanese soils were unsuitable for raising vegetable crops, the Army at first grew all its vegetables in Japan by hydroponic methods. In January 1938, Pan-American World Airways set up an experiment with hydroponics on Wake Island to supply their planes with fresh vegetables. When the Japanese took Wake Island, the hydroponic installations and many of the records of the operations were destroyed. However, one report on the project sent in to the Pan-American Airways offices was very optimistic. The report stated, "It is possible to have year round production at Wake without the expense of glass houses and heating equipment. With the present lack of soil and insufficiency of fresh water, truck crop production is impossible unless hydroponics is employed or soil and water imported....One fourth acre of tanks could be maintained for a year on one month's supply of water for an equal area under soil culture."

In spite of drawbacks and limitations, it is tempting to speculate about a time when hydroponics might become as Sholto Douglas forecasts, "invaluable as a means of food production in countries or areas which have not enough fertile soil to feed their population."

("The Possibilities of Soilless Cultivation," Impact. vol. VI, no. 1. From: UNESCO. N.Y. 17. March 1955. 50¢; "About Hydroponics." From: Supt. of Doc., Wash. 25. 1947. 5¢; "Hydroponics and Food Production," Foreign Agriculture. From: Supt. of Doc., Wash. 25. March 1953. 15¢)

Bell to be UN Delegate

Laird Bell, member of NPA's board of trustees and chairman of its Special Policy Committee on Technical Cooperation, will serve as an Alternate Representative of the United States to the Tenth Session of the General Assembly of the United Nations.

Senator Praises Defense Study

IN JUNE NPA published as a Planning Pamphlet the statement of its special committee on nonmilitary defense planning and a report on "The Tasks of Nonmilitary Defense and the Present Status of Planning" by Dr. William H. Stead. Of this study Senator Hubert H. Humphrey said, "I commend this NPA special committee report to the attention of the Senate. It is one of the most valuable contributions to this vital area of our national security."

The appendix to Dr. Stead's report originally issued in mimeographed form by NPA has now been published by the Government Printing Office at the Senator's recommendation. It explores the present status of nonmilitary defense planning in nine Government departments and agencies and in the electronics, copper, iron and steel, chemicals, petroleum, and life insurance industries. Four sections of the appendix examine specifically nonmilitary defense planning in A. T. & T., Consolidated Edison Co., American Machine and Foundry Co., and the Koppers Co.

(Senate Document No. 60. 57pp. 20¢. From: Supt. of Doc., Wash. 25. 1955. Copies of the Committee statement and Dr. Stead's report are available as PP-92. 91 pp. $1.50. From: NPA. 1955.)

Business Forecasting

COURTNEY C. BROWN, Dean of Columbia University's Graduate School of Business and a member of the NPA board of trustees, has contributed a paper on "The Art of Business Forecasting and Its Use" to a recent study, "Coordination, Control, and Financing of Industrial Research," released by Columbia University Press.

This volume is the fourth in a series of reports on the annual industrial research conferences sponsored by Columbia University's Department of Engineering. In the present volume, which reviews the fifth conference, June 1954, and includes papers presented at the 1953 conference, a group of business executives and scholars consider various problems involved in research administration, particularly the coordination of industrial research with financial aims, sales, quality and product objectives of the business corporation. (From: Columbia University Press, N. Y. 27. 1955. 429 pp. $8.50)

Training and Self-Discipline— Key to Two Careers

THE TRAINING and experience of businessmen provide them with a useful basis for the achievement of a second career, according to Arnold J. Toynbee, noted English historian.

Surveying the accomplishments of two-career businessmen in an article in the "Chicago Review," Toynbee concludes that business experience quickens the development of open-mindedness, judgment, intuition, and the art of communicating ideas. Particularly, he contends, business experience stimulates creative men to exert self-discipline in the application and the planned use of time.

The man trained in business has a realistic response to the pressures of time. "Practical affairs," Toynbee says, in reference to businessmen who have turned to writing history, "...give the future historian an effective preliminary training in a life of action which is the scholar's true life as well as the businessman's, the statesman's, and the soldier's."

Toynbee finds that a "flair for action" is shown in the strict methods of self-education businessmen have evolved to prepare the foundation for their second career. "The self-discipline," he says of one businessman, "that thus declared itself in a patient, as well as a steadfast, pursuit of distant intellectual objectives would not, of course, have borne fruit if it had not also been exercised simultaneously in a day-to-day regimen that made it possible for the scholar-businessman to advance along his self-appointed intellectual path at the tortoise's slow but sure gait."

To illustrate, Toynbee points to the accomplishments of such men as George Grote, 1794-1871, successful banker who persisted in his part-time studies for 20 years before writing his "History of Greece"; Heinrich Schliemann, 1822-1890, archeologist and classical scholar, who mastered 12 foreign languages, then left his offices to discover and excavate the ancient city of Troy; James Ford Rhodes, 1848-1927, who was strikingly successful in his family's business and also became an American historian of distinction.

In common, these men and others more contemporary who have rendered society great public or intellectual service took from their business experience, according to Toynbee, a highly developed sense of economy in the use of time and a staying power which kept them for years in pursuit of long-term objectives.

("A Business School of Intellectual Action," Chicago Review. vol. 9, no. 1, University of Chicago Press, Spring, 1955. 50¢)

The Political Economy of American Foreign Policy

Editorial comment on the report of a study group sponsored by the Woodrow Wilson Foundation and NPA, and published in May:

"When nine persons with the experience and ability of the authors of 'The Political Economy of American Foreign Policy' combine their talents to prepare a work on such a vital subject it ought to be headline news...(their book) constitutes a landmark in thinking and writing on the subject. In it we see why foreign economic policy cannot be dissociated from foreign policy." --Saturday Review, August 6, 1955.

"The study group was rightly disturbed at the dichotomy between economics and politics which so often confuses American thought on foreign policy and weakens its effectiveness." --The Economist, August 13, 1955.

"It is a radical almost visionary, approach... They have reminded Americans that our thinking in the matter of foreign economic policy is not finished, but may be just beginning." --Business Week, May 28, 1955.

"The nine men who have authorized this immensely stimulating study report...have tackled a host of difficult problems and faced up squarely to the most vexing questions in the whole gamut of our contemporary foreign relations....From the happy reintroduction of the term 'political economy' into current use to the concluding forthright evaluation of three broad alternative courses of action for America, this book does great credit to its sponsoring organizations and its authors and renders a most valuable service to every American." --Political Science Quarterly, September 1955.

(From: NPA, or Henry Holt and Co., 383 Madison Avenue, N.Y. 17. 414 pp. $6. — $4.80 to NPA members.)

Finance Corporation Names Director

William L. Batt, member of NPA's board of trustees, has been elected a director of the American Overseas Finance Corporation recently organized by five large American banks to provide a private source of medium-term credit to U. S. exporters.

Two NPA Studies Presented at Geneva Conference

NPA'S FIRST TWO reports on the economic side of peacetime nuclear energy use were brought before an audience of the world's top scientists this summer at the Geneva "Atoms for Peace" conference, previewing a series of comprehensive studies to be published by NPA in coming months. The reports examine the outlook for nuclear power use in light of costs and competition from conventional fuels, and the resulting contributions to economic development.

One study, "Energy Requirements and Economic Growth," was prepared by Dean Edward S. Mason of Harvard University in collaboration with the staff of the NPA Project on the Productive Uses of Nuclear Energy. The paper, presented orally by Dean Mason on the first day of the conference, draws the conclusion that, in view of an expected doubling of world energy requirements by 1975, cheap and abundant nuclear power could represent an important contributing factor to long-run economic growth--if adequate capital, foreign exchange, and other essential elements are available.

The paper places the responsibility of the technological development of competitive nuclear power primarily on the economically advanced countries of the world. It points out, however, that once the use of nuclear power on a massive scale becomes feasible, the major burden of finding the necessary capital inevitably must fall on the countries that wish to exploit it. Foreign loans and grants by the economically advanced countries can be of material assistance, but can never constitute more than a small fraction of the total capital required for the development of both nuclear power and the industries that would use it.

The second report contributed to the conference, "The Outlook for Nuclear Power in Puerto Rico," was prepared by Alvin Mayne of the Puerto Rican Planning Board and Philip Mullenbach, director of research for the NPA project. It foresees that by 1960 nuclear energy may emerge as an important source of electric power for this rapidly industrializing island. By that time, the authors explain, the Atomic Energy Commission will have completed its five-year reactor development program, and the comparative costs of using nuclear fuel and oil will have been established. Puerto Rico, which has no local fuel resources, must now depend on imported oil as its major source of energy. The price trend in imported oil will, therefore, have a significant bearing on the nuclear power potential on the island, the report finds. If the price of fuel oil remains the same or rises between now and 1975, nuclear power may be a justifiable alternative to conventional power, it concludes.

Two NPA staff members, chief economist Gerhard Colm, and Mr. Mullenbach were in Geneva for the conference.

("Reports on the Productive Uses of Nuclear Energy; Energy Requirements and Economic Growth." 51 pp. $1.00; "Outlook for Nuclear Power in Puerto Rico." Mimeographed. 14 pp. 10¢. From: NPA. 1955.)

Solar Energy Conference

RECENT ADVANCES in the practical application of solar energy as a source of power will be reviewed when scientists confer with representatives of industry, agriculture, and government at the World Symposium on Applied Solar Energy to be held in Phoenix, Arizona, November 1-5.

Before taking part in the symposium, scientific specialists will attend a two day conference on the campus of the University of Arizona in Tucson to consider the theoretical aspects of solar energy utilization. Separate conference sections will exchange ideas on the three main processes--thermal, photochemical, and electrical--through which solar energy can be released for use.

The electrical process can be illustrated by Bell Telephone Laboratories' recently improved solar battery operating this summer in an Americus, Ga., experimental station. This experimental equipment, used to convert sunlight into electricity to supply power for rural telephones, has the capacity to store power for use on rainy days.

The solar energy conference and symposium are sponsored jointly by the Stanford Research Institute, the University of Arizona, and the Association for Applied Solar Energy which was formed in 1954 in Phoenix by a number of private citizens.

Universities and Technical Aid

IN A MIDSUMMER appeal to U. S. colleges and universities, the NPA Special Policy Committee on Technical Cooperation urged them to expand their technical assistance to Latin American universities pointing out that universities should concentrate their highly specialized talents on the field of education and leave work on specific development projects to commercial firms. The Committee advised American universities to work in close and direct relationship with Latin American educational institutions helping them to establish within their own borders self-supporting replicas of the fine centers of education and research that have for many years spread the seeds of technical know-how in the United States.

The Committee also urged that the U. S. Government grant more freedom to universities when awarding contracts under technical cooperation programs, but cautioned that in return universities would have conscientiously to fulfill their contract agreements on their activities.

The Committee concluded that a high-ranking joint committee of governments, universities, and private groups should be set up to tackle current and future problems hindering the effectiveness of these vital programs, and should make specific recommendations on procedure and methods of operation on the basis of continuing objective study of all phases of university cooperation.

("Technical Cooperation in Latin America: The Role of Universities in Technical Cooperation." From: NPA. 1955. 23 pp. 50¢.)

Export-Import Bank Appointee

THE EXPORT-IMPORT Bank has appointed David J. McDonald, National Council member, to a nine-man Advisory Committee. Mr. McDonald is president of the United Steel Workers of America.

The Committee members representing business, finance, agriculture, and labor backgrounds, will meet one or more times a year at the call of the Bank's president to discuss program and policy.

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